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Appeal Brief - Patents	10/050,061

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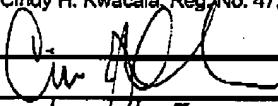
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		Filing Date	January 15, 2002
		First Named Inventor	Toren S. DAVIS
		Art Unit	3683
		Examiner Name	M. Torres
Total Number of Pages in This Submission	15	Attorney Docket Number	H0002526(A66) US-1622

ENCLOSURES (Check all that apply)

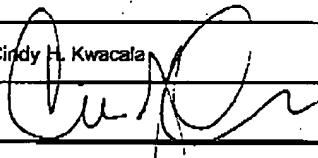
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Firm or Individual name	Cindy H. Kwacala, Reg. No. 47,667
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of: Toren S. DAVIS Group Art Unit: 3683
Serial No.: 10/050,061 Examiner: M. Torres
Filed: January 15, 2002 Docket No.: H0002526(A66) US-1622

For: TUNED MASS DAMPER USING A HEXAPOD

SUBMISSION OF APPELLANT APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
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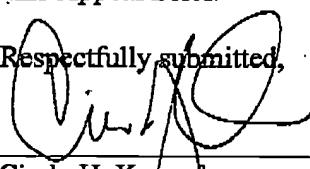
Sir:

Appellant hereby submits its Appeal Brief in response to the final rejection of the subject patent application.

The Commissioner is hereby authorized to charge Ingrassia, Fisher & Lorenz, Deposit Account No. 50-2091, \$500 for the filing of this Appeal Brief.

Dated 2/21/05

Respectfully submitted,


Cindy H. Kwacala
Registration No. 47,667

Ingrassia, Fisher & Lorenz
Customer No. 29,906

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

5

In re application of: Toren S. DAVIS Group Art Unit: 3683

10 Serial No.: 10/050,061 Examiner: M. Torres

Filed: January 15, 2002 Docket No.: H0002526(A66)US-1622

15 For: TUNED MASS DAMPER USING A HEXAPOD

20

APPEAL BRIEF PURSUANT TO 37 C.F.R. § 41.37

25 Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

30 Sir:

This is an Appeal Brief under 37 C.F.R. § 41.37 appealing the final rejection of the Examiner dated January 13, 2005. Each of the topics required by 37 C.F.R. § 41.37 is presented in this Brief and is labeled appropriately.

I. Real Party in Interest

Honeywell International, Inc. ("Honeywell) is the real party in interest of the present application. An assignment of all rights in the present application to Honeywell 5 was executed by the inventor and recorded by the U.S. Patent and Trademark Office at Reel 012982, Frame 0810.

II. Related Appeals and Interferences

There are no appeals or interferences related to the present application of which 10 Appellant is aware.

III. Status of Claims

Claims 5, 7, 8-10, and 12-14, which are presented in the Appendix, stand finally 15 rejected. Accordingly, the Appellant hereby appeals the final rejection of Claims 5, 7-10, and 12-14.

IV. Status of Amendments

20 In response to a first Office Action dated April 9, 2003 in which initially filed claims 1-4 were rejected, Appellant cancelled claims 1-4 and added new claims 5-14. A final Office Action issued on July 16, 2003 and rejected claims 5-14. Appellant responded to the final Office Action and cancelled claims 6 and 11. An Advisory Action 25 was issued on October 2, 2003 alleging that the amendment was entered, but that it did not place the application in condition for allowance. Subsequently, a request for continued examination was filed.

The Examiner issued a first Office Action on October 31, 2003 rejecting claims 5, 7-10, and 12-14. In response, Appellant amended claims 5, 7, and 12 to correct minor cosmetic, grammatical, and typographical errors. A final Office Action was issued on 30 April 20, 2004 rejecting claims 5, 7-10, and 12-14. In response, Appellant amended

claims 5, 7, 10, and 12. An Advisory Action issued on June 16, 2004 stating that the Appellant's amendment was not entered because the newly added limitations were new issues which required further consideration and search.

A Request for Continued Examination was subsequently filed and an Office Action issued on August 11, 2004 rejecting claims 5, 7-10, and 12-14. Appellant then filed an amendment amending claims 5 and 10. In response, the Examiner issued a final Office Action on January 13, 2005 to which this Appeal Brief responds.

10

V. Summary of Claimed Subject Matter

The present invention relates to a tuned mass damper. The tuned mass damper includes a mass 10 and a plurality of isolators 14. See p. 3, ll. 14-17. The mass 10 has predetermined inertia properties. See p. 4, ll. 14-17. The plurality of isolators 14 are arranged in a hexapod configuration. See p. 4, ll. 2-3. Each isolator 14 has at least a first end and a second end. See Figs. 1-3. Each isolator first end is coupled to the mass 10 (see id.) and each isolator second end is adapted to couple to a structure 12 that may experience vibrations at particular frequencies and at particular locations on the structure in six independent degrees of freedom. See p. 4, ll. 11-17. Each of the isolators 14, in combination with the mass 10, is configured to be tuned independent of the other isolators 14 to reduce a first particular frequency of the vibrations experienced by the structure 12 at a first particular location on the structure 12. See p. 4, ll. 11-14.

In another embodiment of the invention, a system is provided that includes at least a structure 12 that experiences vibrations at particular frequencies in six degrees of freedom and at particular locations on the structure 12. See p. 4, ll. 11-17. The system includes a mass 10 having predetermined inertia properties, see p. 4, ll. 14-17, and a plurality of isolators 14. The isolators 14 are arranged in a hexapod configuration, see p. 4, ll. 2-3, and each isolator 14 has at least a first end and a second end. See Figs. 1-3. Each isolator first end is coupled to the mass 10 and each isolator second end coupled to the structure 12. See id. Each of the isolators 14, in combination with the mass 10, is

configured to be tuned independent of the other isolators 14 to reduce a first particular frequency of the vibrations experienced by the structure 12 at a first particular location on the structure 12. See p. 4, ll. 11-14.

5

VI. Grounds of Rejection to be Reviewed on Appeal

The grounds of rejection to be reviewed in this appeal are as follows:

1. Claims 5, 7, 10, and 12 stand rejected under 35 U.S.C. § 102 (b) as allegedly being anticipated by U.S. Patent No. 6,315,094 (Griffin).
- 10 2. Claims 8 and 13 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Griffin in view of Cunningham.
3. Claims 9 and 14 were rejected under 35 U.S.C. § 103 (a) as allegedly being unpatentable over Griffin in view of Gran et al.

15

VII. Arguments

I. CLAIMS 5, 7, 10, AND 12 ARE NOT ANTICIPATED UNDER 35 U.S.C. § 102(B) OVER GRiffin

20 In the final Office Action dated January 13, 2005, Claims 5, 7, 10, and 12 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated over Griffin. As will be explained in more detail further below, this rejection is not tenable because at least one element recited in independent Claims 5 and 10 is not found in the cited reference.

25

A. Griffin

Griffin teaches a virtual sky hook vibration isolation system that reduces transmissibility at resonance without significantly increasing high frequency transmissibility. The system includes a primary mass coupled to an external base by a primary suspension system and a secondary mass connected to the primary mass by a secondary suspension system. See Claim 1. The secondary suspension system can

include a hexapod suspension that is used to attenuate disturbances acting on the primary mass. See col. 7, ll. 14-28.

B. Analysis

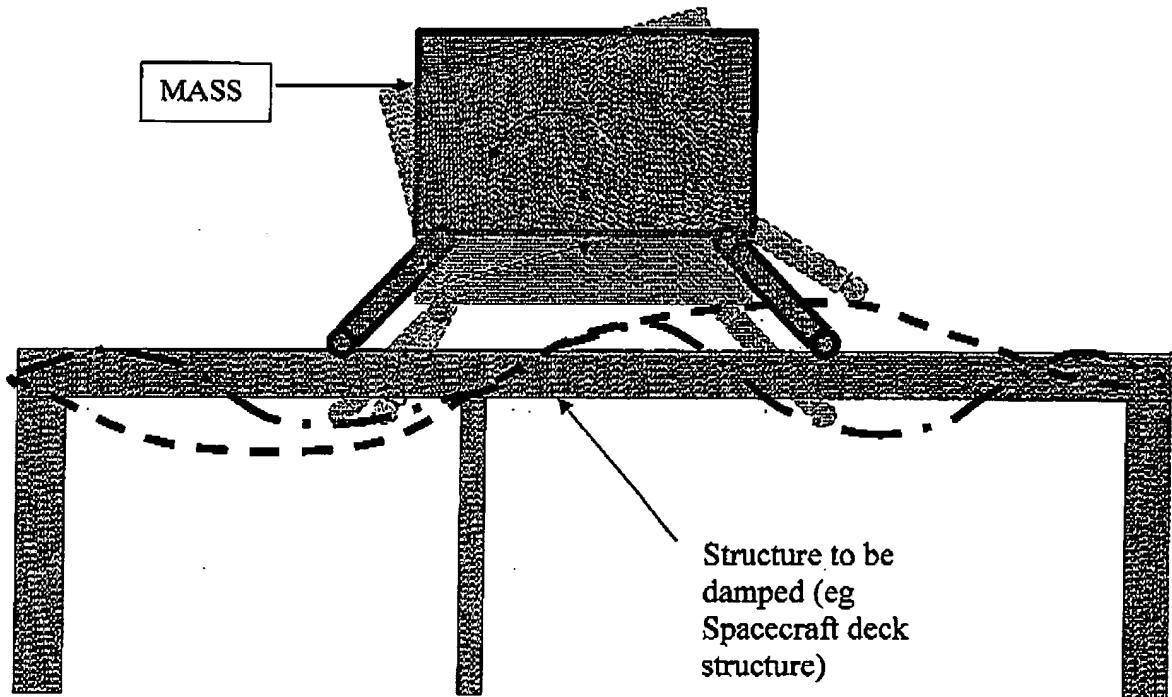
5 It is well settled that in order to anticipate a claim, a citation must expressly or inherently describe all of the elements of the claimed subject matter. In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950 (Fed. Cir. 1999); Constant v. Advanced Micro-Devices, Inc., 848 F.2d 1560, 1571, 7 USPQ2d 1057, 1064 (Fed. Cir. 1988). The citation must describe and enable the claimed invention, including all claim limitations, 10 with sufficient clarity and detail to establish that the subject matter already existed in the prior art and that its existence was recognized by persons of ordinary skill in the field of the invention. Crown Operations International, Ltd. v. Solutia Inc., 289 F.3d 1367, 1375, 62 USPQ2d 1917, 1921 (Fed. Cir. 2002); In re Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990) ("the reference must describe the applicant's claimed 15 invention sufficiently to have placed a person of ordinary skill in the field of the invention in possession of it"). Thus, an allegedly anticipating citation "must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter." PPG Industries, Inc. v. Guardian Industries Corp., 75 F.3d 1558, 1566, 37 USPQ2d 1618, 1624 (Fed. Cir. 1996). However, this is not the case here.

20 It is clear from the above description of Griffin, that Griffin lacks several of the elements recited in Claims 5 and 10. For example, Griffin fails to disclose, either explicitly or inherently, at least a system having isolators that, in combination with the mass, are *configured to be tuned independent of the other isolators*. In fact, there is no mention whatsoever that the isolators are tunable at all. Instead, Griffin only mentions 25 placing isolators into a hexapod configuration. Moreover, Griffin fails to mention or suggest reducing a first particular frequency of the vibrations experienced by the structure *at a first particular location on the structure*. Griffin merely discloses generally attenuating disturbances, including moments, acting on the primary mass. There is no mention whatsoever of the isolators being able to tune vibrations *at a first particular 30 location on the structure*.

By locating each isolator second end at particular locations on the structure, adjusting the stiffness and damping capability of each isolator independent of the other isolators at each of the particular locations, and adjusting the mass properties, numerous modes and mode shapes of realistic structures can be damped, such as shown in the 5 illustration below. Here, two exemplary modes, Mode 1 and Mode 2, are damped by the particular locations of the isolators, two of which are shown, by adjusting the stiffness and damping capability of each isolator at each of the particular locations, and by adjusting the mass properties.

10

- — — — Mode 1 is damped by a first mode of the hexapod
- - — Mode 2 is damped by a second mode of the hexapod



Griffin does not teach or suggest this type of application, which requires the capability of

independent tuning of the isolators to operate properly. Instead, Griffin teaches reducing a resonant response of a dependent and specific isolation system using a hexapod, *not* reducing a modal response of *any structure by independently tuning the isolators*.

5 The Examiner further alleges that the novelty of the Appellant's invention lies in the hexapod configuration. This is not the case. Instead, the novelty, as claimed in Claims 5 and 10, lies in the combination of locating each isolator at particular locations, the use of a mass, and the capability of independently tuning of each isolator.

10 Thus, since Griffin fails to disclose, either explicitly or inherently, at least the above-mentioned elements recited in each of independent Claims 5 and 10, this citation cannot anticipate either of these claims. Moreover, because independent Claims 5 and 10 are not anticipated, then dependent Claims 7 and 12 are also not anticipated.

II. CLAIMS 8 AND 13 ARE NOT UNPATENTABLE UNDER 35 U.S.C. §
15 103 OVER GRiffin IN VIEW OF CUNNINGHAM

20 The final Office Action dated January 13, 2005 also rejected Claims 8 and 13 under 35 U.S.C. § 103 as being unpatentable over Griffin in view of Cunningham. As will be explained in more detail herein below, this rejection is not tenable because at least one element recited in independent Claims 5 and 10 is not found in the cited reference.

A. Griffin

Griffin was described above, and will therefore not be described further.

25 B. Cunningham

Cunningham teaches a system for isolating a supported structure from transmitting vibrations to a supporting base in a spacecraft by providing six degrees of freedom in a kinematic mounting. See Abstract. The system includes six isolator elements that employ two degrees of freedom flexure joints at each mounting point and have tuning springs to optimize performance. See id.

C. Analysis

It is well settled that the Examiner bears the initial burden of establishing a *prima facie* case of obviousness. In re Fine, 837 F.2d 1071, 1074 (Fed. Cir. 1988). The 5 Examiner has the burden of setting forth a detailed evidentiary basis for the teaching, suggestion or motivation to combine the cited references. As the Court of Appeals for the Federal Circuit recently reiterated, the factual inquiry of whether to combine references must be thorough and searching, and must be based upon objective evidence of record. In re Sang Su Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Moreover, a claim 10 cannot be found *prima facie* obvious unless all the elements of the claim are taught or suggested in the cited art. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974); In re Wilson, 424 F.2d 1382, 1385 (C.C.P.A. 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."). Just because a prior art reference *can* be modified does not render the proposed modification obvious 15 unless the prior art suggests the desirability of making the proposed modification. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Appellant submits that the Examiner has not met his burden, since the references cited do not teach or suggest all of the claim elements, nor the desirability of the modification proposed by the Examiner in the final Office action.

20 In the final Office action, the Examiner alleges that Griffin teaches each isolator second end is adapted to couple to a predetermined location thereon, but does not teach wherein each isolator comprises a spring having an adjustable spring constant wherein each isolator is individually tuned by adjusting its spring constant and the predetermined location on the structure to which its second end will couple. The Office Action further 25 alleges that Cunningham teaches the isolator structure and that it would have been obvious to one of ordinary skill in the art to have tuned and adjusted each isolator to provide the desired vibration isolation in six degrees of freedom.

Claims 8 and 13 depend from independent Claims 5 and 10, respectively, and therefore, rely on the arguments presented above regarding Griffin. Moreover, 30 Cunningham does not make up for the deficiencies of Griffen et al. Specifically,

Cunningham does not teach *locating each isolator at particular locations*, which, in conjunction with the use of a mass and the capability of independently tuning of each isolator, are needed to operate the isolator and are recited in claims 5 and 10.

Thus, a *prima facie* case of obviousness has not been established. Accordingly,
5 Claims 8 and 13 are nonobvious. In re Fine, *supra*.

III. CLAIMS 9 AND 14 ARE NOT UNPATENTABLE UNDER 35 U.S.C. §
103 OVER GRIFFIN IN VIEW OF GRAN

The final Office Action dated January 13, 2005 also rejected Claims 9 and 14
10 under 35 U.S.C. § 103 as being unpatentable over Griffin in view of Gran. As will be explained in more detail herein below, this rejection is not tenable at least because suggestion or motivation to combine are not found in the cited references.

A. Griffin

15 Griffin was described above, and will therefore not be described further.

B. Gran

Gran discloses a vibration isolation and precision pointing device for reducing
20 vibrational disturbances on a payload platform. See Abstract. The device may be arranged in three pairs to damp vibration in three axes and includes a passive spring and an active actuator element. See id. The passive spring reduces coupling of vibration at higher frequencies, while the active actuator element applies active compensation over a selected bandwidth of frequencies below that over which passive isolation is most
25 effective. See id.

C. Analysis

Claims 9 and 14 depend from independent Claims 5 and 10, respectively, and
30 therefore, rely on the arguments presented above regarding Griffin. Moreover, Gran does

not make up for the deficiencies of Griffen. Specifically, Gran does not teach *locating each isolator at particular locations*, which, in conjunction with the use of a mass and the capability of independently tuning of each isolator, are needed to operate the isolator and are recited in claims 5 and 10.

5 Thus, a *prima facie* case of obviousness has not been established. Accordingly, Claims 9 and 14 are nonobvious. In re Fine, *supra*.

10

VIII. Conclusion

In view of the foregoing, Appellant submits that the final rejection of Claims 5, 7, 8-10, and 12-14 is improper and should not be sustained. Therefore, a reversal of the rejections in the final Office Action dated January 13, 2005 is respectfully requested.

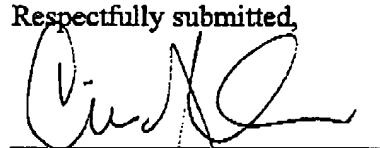
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Dated 2/21/05

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Ingrassia, Fisher & Lorenz
Customer No. 29,906

Respectfully submitted,



Cindy H. Kwacala
Registration No. 47,667

IX. APPENDIX
Claims on Appeal

5

1-4 (Canceled).

5. A tuned mass damper, comprising:

a mass having predetermined inertia properties; and

10 a plurality of isolators arranged in a hexapod configuration, each isolator having at least a first end and a second end, each isolator first end coupled to the mass and each isolator second end adapted to couple to a structure that may experience vibrations at particular frequencies and at particular locations on the structure in six independent degrees of freedom,

15 wherein each of the isolators, in combination with the mass, is configured to be tuned independent of the other isolators to reduce a first particular frequency of the vibrations experienced by the structure at a first particular location on the structure.

6. (Canceled).

20

7. The damper of Claim 5, wherein each of the isolators, in combination with the mass, is configured to be tuned such that tuning a combination of two or more isolators reduces a second particular frequency.

25 8. The damper of Claim 5, wherein:

each isolator comprises a spring having an adjustable spring constant;

each isolator second end is adapted to couple to the structure at a predetermined location thereon; and

each isolator is individually tuned by adjusting its spring constant and the

30 predetermined location on the structure to which its second end will couple.

9. The damper of Claim 5, wherein each isolator comprises:
a tubular damping strut coupled between the isolator first and second ends;
a first spherical pivot coupled to the isolator first end; and
5 a second spherical pivot coupled to the isolator second end.

10. In a system including at least a structure that experiences vibrations at particular frequencies in six degrees of freedom and at particular locations on the structure, a tuned mass damper comprising:

10 a mass having predetermined inertia properties; and
a plurality of isolators arranged in a hexapod configuration, each isolator having at least a first end and a second end, each isolator first end coupled to the mass and each isolator second end coupled to the structure,
wherein each of the isolators, in combination with the mass, is configured to be
15 tuned independent of the other isolators to reduce a first particular frequency of the vibrations experienced by the structure at a first particular location on the structure.

11. (Canceled).

20 12. The damper of Claim 10, wherein each of the isolators, in combination with the mass, is configured to be tuned such that tuning a combination of two or more isolators reduces a second particular frequency.

13. The damper of Claim 10, wherein:
25 each isolator comprises a spring having an adjustable spring constant;
each isolator second end is adapted to couple to the structure at a predetermined location thereon; and
each isolator is individually tuned by adjusting its spring constant and the predetermined location on the structure to which its second end will couple.

30

14. The damper of Claim 10, wherein each isolator comprises:
a tubular damping strut coupled between the isolator first and second ends;
a first spherical pivot coupled to the isolator first end; and
a second spherical pivot coupled to the isolator second end.